

7.3 Trigonometric Substitutions

Integrals Involving $\sqrt{a^2 - x^2}$ (Use the substitution: $x = a \sin(\theta)$)

Example 1 Find the area bounded by a circle of radius 4 in the first quadrant on the interval $[2, 4]$.

Integrals involving $\sqrt{a^2 + x^2}$ (Use the substitution $x = a \tan(\theta)$)

Example 2 Evaluate: $\int \frac{5}{x^2 \sqrt{x^2+4}} dx$

Integrals Involving $\sqrt{x^2 - a^2}$ (Use the substitution $x = a \sec(\theta)$)

Example 3 Evaluate the integral $\int \frac{\sqrt{x^2 - 2x - 3}}{x - 1} dx$

Example 4 Evaluate the integral $\int \frac{1}{(5 - 4x - x^2)^{5/2}} dx$